

**Patent Claims**

1. Electromigration test apparatus having:  
a direct-current source;  
5 an AC voltage source;  
a circuit having at least one conductive structure  
to be tested, which is electrically coupled to the  
direct-current source and the AC voltage source;  
and  
10 a measuring device, which is set up in such a way  
that it detects an electrical parameter which is  
indicative of electromigration in the conductive  
structure to be tested;  
the AC voltage source being set up in such a way  
15 that it exposes the conductive structure to be  
tested to an alternating current, independently of  
a direct current of the direct-current source and  
thus heats the conductive structure to be tested  
to a predetermined temperature that can be set.  
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2. Apparatus according to Claim 1, the electrical  
parameter being a resistance of the conductive  
structure to be tested.
- 25 3. Apparatus according to Claim 1 or 2, which  
furthermore has an evaluation unit for determining  
an electrical power, the evaluation unit having a  
voltage measuring device and a current measuring  
device which are implemented in the circuit in  
30 such a way that, by means thereof, a root-mean-  
square current through the conductive structure to  
be tested and a root-mean-square voltage across  
the conductive structure to be tested can be  
detected.  
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4. Apparatus according to one of Claims 1 to 3, a  
control device being provided, which is set up in  
such a way that the control device controls the AC  
voltage source in such a way that the temperature

of the conductive structure to be tested can be kept constant.

- 5        5.    Apparatus according to one of Claims 1 to 4, the  
         conductive structure to be tested being arranged  
         on or in a semiconductor wafer.
- 10       6.    Apparatus according to one of Claims 1 to 5, the  
         alternating-current source and the direct-current  
         source being integrated in a pulse generator.
- 15       7.    Apparatus according to one of Claims 1 to 6, which  
         furthermore has a heating furnace set up in such a  
         way that it heats the conductive structure to be  
         tested.
- 20       8.    Method for testing a conductive structure for  
         electromigration, having the following steps:  
         electrical coupling of a conductive structure to  
         be tested to an electrical circuit electrically  
         coupled to a direct-current source and an  
         alternating-current source;  
25       supply of the conductive structure to be tested  
         with a direct current which causes the  
         electromigration within the conductive structure  
         to be tested;  
         heating of the conductive structure to be tested  
         by means of the alternating current, the  
         alternating current being independent of a direct  
30       current, which direct current brings about the  
         electromigration within the conductive structure  
         to be tested; and  
         detection of an electrical parameter which is  
         indicative of the electromigration within the  
35       conductive structure to be tested.
9.    Method according to Claim 8, a resistance of the  
         conductive structure to be tested being detected  
         as the electrical parameter.

10. Method according to Claim 8 or 9, in which, as  
further steps, a root-mean-square current in the  
conductive structure to be tested and a root-mean-  
square voltage across the conductive structure to  
be tested are detected and an electrical power is  
determined therefrom.
11. Method according to one of Claims 8 to 10, the  
temperature of the conductive structure to be  
tested being regulated to a constant value by  
means of the evaluation unit.
12. Method according to one of Claims 8 to 11, the  
conductive structure to be tested being formed on  
or in a semiconductor wafer.